

10-6 What is a parallel circuit?

Objectives ▶ Describe a parallel electric circuit.
▶ Compare a parallel circuit and a series circuit.

TechTerm

▶ **parallel circuit:** circuit in which electric current can follow more than one path

Parallel Circuits In a **parallel circuit**, the electric current can follow more than one path. Look at Figure 1. Three lamps are connected to one battery. Notice how the wires are connected to each lamp. The current flows along three separate paths, one for each lamp. If one of the lamps goes out, the other two lamps will still remain lit.

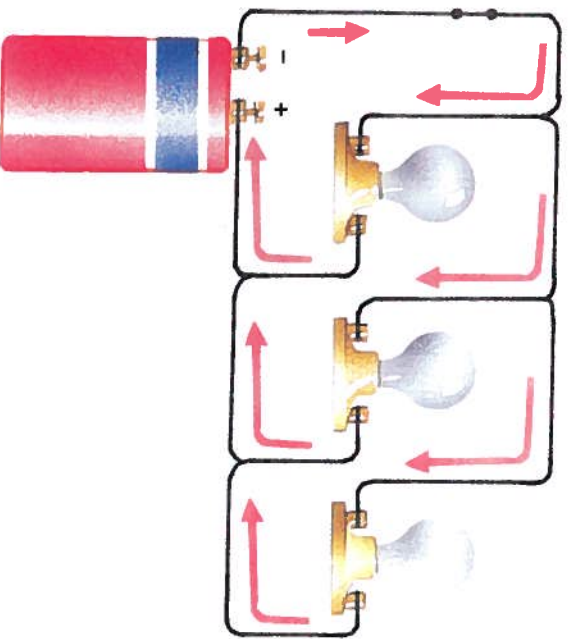


Figure 1

▶ **Define:** What is a parallel circuit?

Series vs Parallel Circuits Suppose a battery, wires, and three lamps are connected in a series circuit. What happens if one of the lamps goes out? The current flowing to that lamp will be stopped. When the current in a series circuit is stopped at any point, the whole circuit becomes

open. None of the lights will work. In a parallel circuit, the current can follow more than one path. The lamps are on different branches. If one lamp goes out, current can still reach the other lamps.

▶ **Describe:** What happens to the current in a series circuit when a lamp goes out?

Uses for Parallel Circuits The electric circuits in your home are parallel circuits. When appliances are plugged into wall outlets, they are connected to parallel circuits. If one appliance stops working, electric current keeps flowing in the circuit. The other appliances keep working. Most schools and office buildings also use parallel electric circuits.

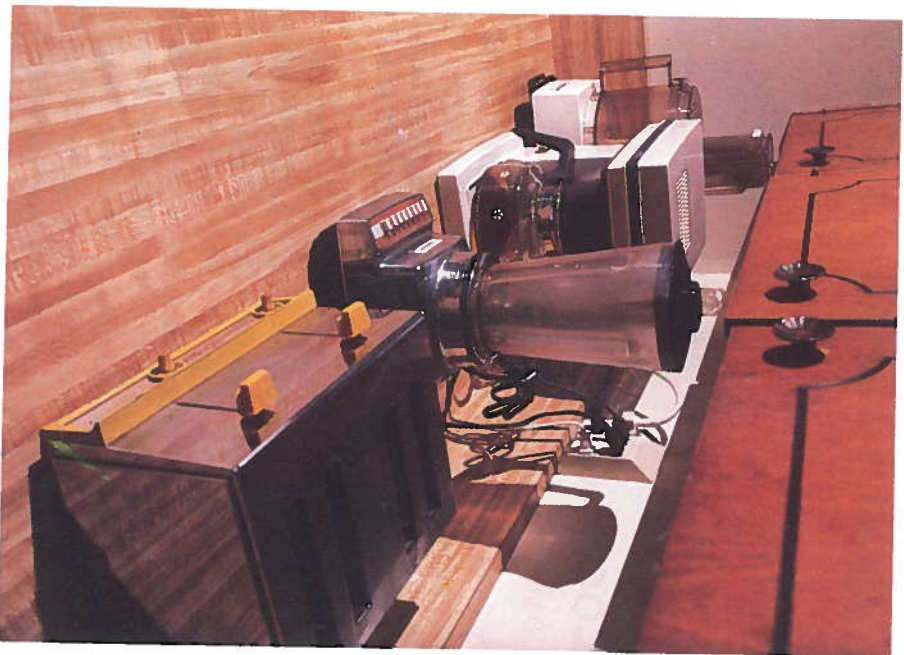


Figure 2

▶ **Infer:** Why are parallel circuits used in homes, schools, and office buildings?

LESSON SUMMARY

- ▶ In a parallel circuit, the electric current can follow more than one path.
- ▶ If several appliances are connected in a parallel circuit, current can still reach the other appliances if one of them stops working.
- ▶ Parallel circuits are used in homes, schools, and office buildings.

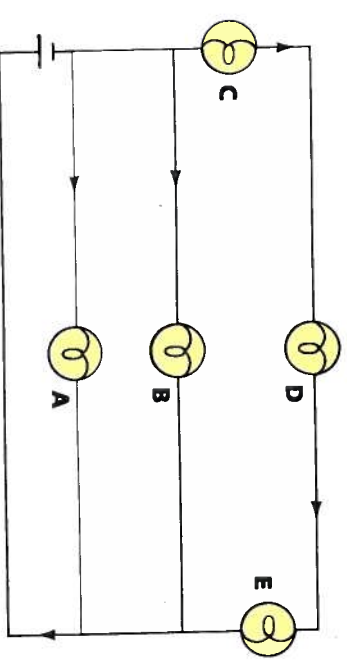
CHECK Complete the following.

1. In a _____ circuit, the current follows only one path.
2. In a _____ circuit, the current can follow more than one path.
3. If two lamps are connected in a series circuit and one of them goes out, the circuit becomes an _____ circuit.
4. Homes, offices, and schools use _____ electric circuits.

APPLY Complete the following.

5. A string of Christmas tree lights goes out when one bulb stops working. Are the lights connected in series or parallel?

6. **Interpret:** Look at the circuit diagram. Which lamps are connected in parallel? Which are in series?



7. **Infer:** Are the circuits in a car parallel or series? How do you know?

Ideas in Action

IDEA: Parallel circuits are used more often than series circuits.

ACTION: Look at the manual for a portable radio and find the circuit diagram. How many series circuits does it have? How many parallel circuits?

CAREER IN PHYSICAL SCIENCE

COMPUTER PROGRAMMER

Computers are complicated electronic machines that are designed to do certain tasks. A computer operates by means of a computer program. A computer program is a list of instructions. A computer programmer writes the instructions for the computer in computer language.

A programmer's job is to develop software for business, science, entertainment, education, and other fields. Programmers work with experts from various fields to develop new software for such things as graphics, computer-aided design, animation, and learning.

Programmers write instructions in computer language. They must know different computer languages and what they are used for. Languages that programmers might use include BASIC (general purpose), FORTRAN (scientific applications), C/C++ (operating systems), LISP (artificial intelligence), or Java (Internet).

